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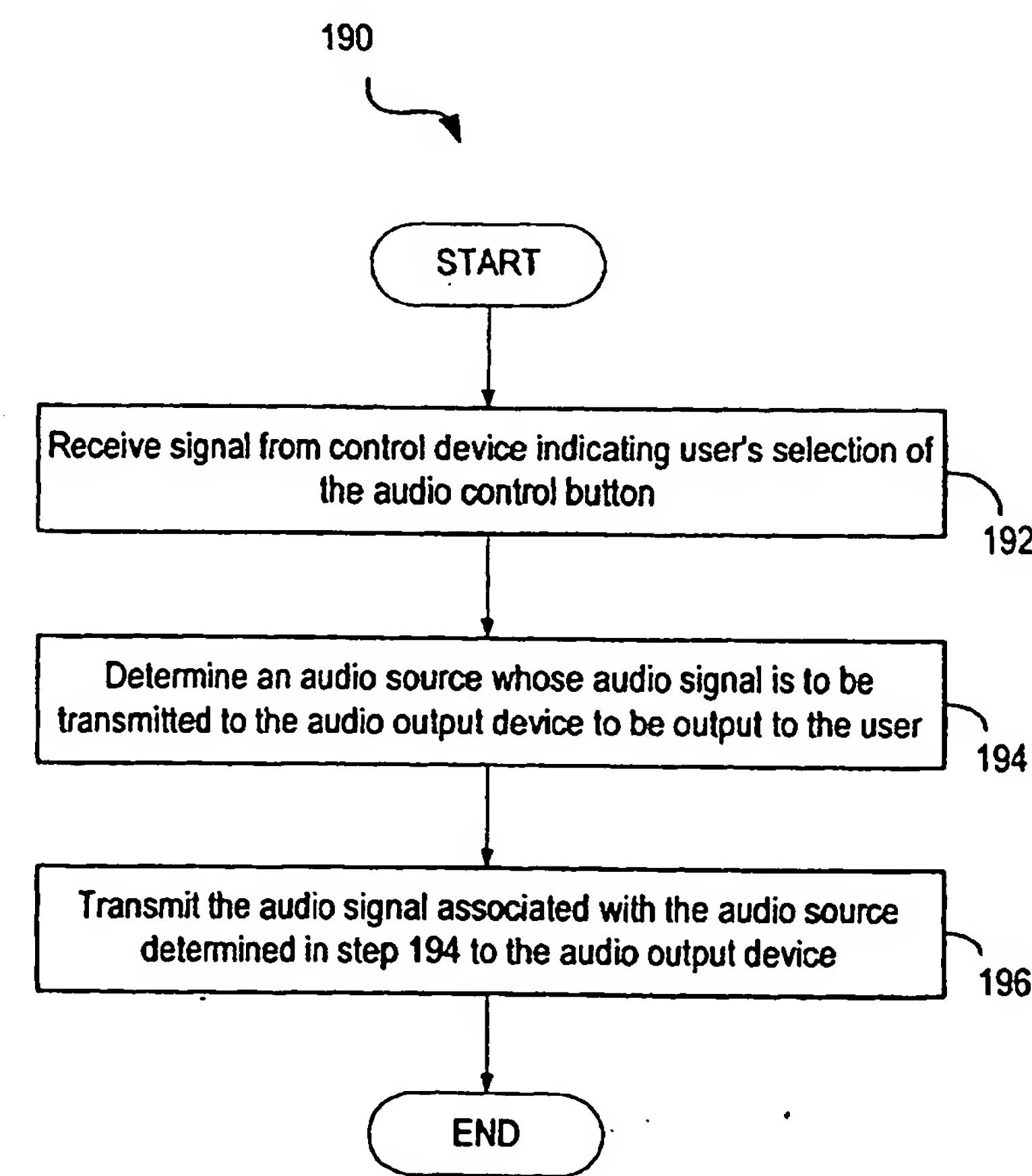
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[Continued on next page]

(54) Title: AUDIO SOURCE CONTROL TECHNIQUES



(57) Abstract: A system for viewing Web content information and television content information, where the Web and television content information may include a plurality of audio sources. Upon receiving a signal (192) from a control device, such as a TV remote control device, selects an audio source from the plurality of audio sources (194) and transmits audio signals associated with the audio source to an audio output device (196).

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## AUDIO SOURCE CONTROL TECHNIQUES

### CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority from the following U.S. Provisional Patent

5 Applications, the entire disclosures of which are herein incorporated by reference for all purposes:

(1) U.S. Provisional Patent Application No. 60/193,046, entitled "USER INTERFACE FOR INTERACTIVE TELEVISION WITH BROADBAND CONNECTIVITY TO THE INTERNET," filed March 29, 2000; and

10 (2) U.S. Provisional Patent Application No. 60/\_\_\_\_\_, (Attorney Docket No. 20492-000500US) entitled "AUDIO SOURCE CONTROL TECHNIQUES" filed August 3, 2000.

### BACKGROUND OF THE INVENTION

15 The present invention relates to systems providing Web content and television content information to users, and more particularly to techniques for controlling the sources of audio signals output to a user.

Televisions and Internet technologies are beginning to converge. For example, the Internet is gaining television like qualities , such as the capability to play 20 videos and music, and to broadcast live video feeds, and televisions are becoming more interactive like the Internet. In particular, access to the World Wide Web via Internet-enabled television systems is progressing and becoming more popular. Such television systems allow users to access both Web content information and television content information from a single system. Since a majority of the Web and television content 25 information comprises of multimedia content, these Internet-enabled televisions also provide controls to manipulate audio and video information contained in the multimedia content. However, conventional devices and television systems do not provide for user-friendly ways to access audio information contained in the Web content and the television content.

30 U.S. Patent No. 6,005,563, entitled "USER INTERFACE FOR CONTROLLING AUDIO FUNCTIONS IN A WEB BROWSER," discloses browser software implemented in a set-top box which allows a user to download audio files from Web sites and generate sound through a speaker of a television set based on the audio

files. The browser also enables playback of background music during Web browsing based on audio files downloaded from one or more servers or audio files stored in memory in the set-top box. An audio panel may also be displayed when an audio file from a Web site is downloaded and played to form a user interface which allows the user 5 to play, stop, pause, rewind, or fast-forward the audio file. This browser software however has limited capabilities as it does not allow a user to readily switch between the various audio sources embedded in television or Web content. The functionality provided by the browser is only applicable to a particular audio file downloaded from the web.

Accordingly, techniques in Internet-enabled systems which allow users to 10 have better control over audio information contained in the Web or television content are desired.

#### SUMMARY OF THE INVENTION

The present invention discusses techniques for controlling the sources of 15 audio signals output to a user. According to an embodiment, the present invention, provides techniques for outputting audio information associated with Web content information and television content information in a system for viewing Web content information and television content.

According to an embodiment, the present invention receives Web content 20 information and television content information, where the Web and television content information may include a plurality of audio sources. Upon receiving a signal from a control device, such as a TV remote control device, the present invention selects an audio source from the plurality of audio sources and transmits audio signals associated with the audio source to an audio output device.

According to another embodiment of the present invention, the audio 25 source may be selected using several different techniques. According to a first technique, the present invention may generate an ordered list of the plurality of audio sources included in the Web and television content. The embodiment of the present invention may then determine the current audio source whose signals are output via the audio output device, and upon receiving the signal from the control device, select an audio source which follows the current audio source in the ordered list of audio sources. According to another embodiment, the present invention may cycle through the plurality 30 of audio sources. According to yet another embodiment, a user may specifically select an

audio source from the plurality of audio sources whose signals are to be output via the audio output device.

According to another embodiment, the present invention provides a system for viewing Web content information and television content information. The system according to an embodiment of the present invention comprises a set-top box configured to receive Web content information and television content information via a first communication link, where the Web and television content information includes a plurality of audio sources. The system further comprises an audio output device coupled to the set-top box and a control device configured to transmit signals to the set-top box via a second communication link. According to an embodiment of the present invention, the set-top box is configured to receive a signal from the control device, to determine an audio source from the plurality of audio sources in response to the signal, and to transmit audio signals associated with the audio source to the audio output device. The audio output device is configured to output the audio signals associated with the first audio source.

Further understanding of the nature and advantages of the present invention may be realized by reference to the remaining portions of the specification and the attached drawings.

20

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 depicts a system for distributing Internet content and television content according to an embodiment of the present invention;

Fig. 2 depicts a client system for presenting Web and television information to a user according to an embodiment of the present invention;

25 Fig. 3 depicts an exemplary set-top box according to an embodiment of the present invention;

Fig. 4 depicts an exemplary control device according to an embodiment of the present invention;

30 Fig. 5 depicts a simplified flowchart showing processing performed by the client system according to an embodiment of the present invention;

Fig. 6 depicts a simplified flowchart showing processing performed by a set-top box for cycling through a list of available audio sources according to an embodiment of the present invention; and

Fig. 7 depicts a simplified flowchart showing processing performed by a set-top box according to an embodiment of the present invention.

#### DESCRIPTION OF THE SPECIFIC EMBODIMENTS

5 Fig. 1 is a simplified diagram depicting a system 100 for distributing Internet content, in addition to television content, in accordance with an embodiment of the present invention. In accordance with an embodiment of the present invention, system 100 is integrated with a cable TV distribution system. Such cable television distribution systems may include cable headends and are well known in the art.

10 As shown in Fig. 1, system 100 includes a communication network 102, a plurality of content sources 104, a plurality of distribution centers (depicted as headends or H/E) 106, and a plurality of client systems (depicted as CSs) 108. Communication network 102 provides a mechanism for distributing multimedia content from content sources 104 to distribution centers 106. Communication network 102 may itself be  
15 comprised of many networks, interconnected computer systems and communication links. While in one embodiment, communication network 102 is the Internet, in other embodiments, communication network 102 may be any suitable computer network. For purposes of describing the present invention, it will be assumed that communication network 102 is the Internet. Communications over Internet 102 are accomplished using  
20 standard protocols such as TCP/IP (transmission control protocol/internet protocol) and other protocols. System 100 depicted in Fig. 1 is merely illustrative of an embodiment incorporating the present invention and does not limit the scope of the invention as recited in the claims. One of ordinary skill in the art would recognize other variations, modifications, and alternatives.

25 As shown in Fig. 1, content sources 104 may be coupled to Internet 102. Additionally, content sources 104 may be coupled to a plurality of data feeds, servers, and information sources which in turn provide content information to content sources 104. For example, a content source 104 may receive content information from data feeds 112, advertisement servers 114, image sources 116, streaming multimedia sources 118,  
30 including streaming audio and streaming video sources, and other like sources of content information. For example, news or stock quote feeds 112 may be fed into content source 104, servers 114 may provide advertisements for insertion into multimedia content delivered by content source 104, and sources 116/118 may provide images 116, streaming video 118, and other content to content source 104. Various other feeds, servers and

sources may also be coupled to content source 104. Examples of content sources 104 include web site portals such as Go2Net.com, or news web sites such as CNN.com, and the like.

Content sources 104 may also be coupled directly to distribution centers 106 via communication links or communication networks 120. Communication links 120 may include may be hardwire links, optical links, satellite or other wireless communication links, wave propagation links, or any other mechanisms for communication of multimedia content information.

Distributions centers 106 may be coupled to Internet 102, and to content sources 120 via communication links 120. Each distribution center 106 may also be coupled to a plurality of client systems 108. A distribution center is configured to receive content information from content sources 104 and Internet 102, and to forward the content information to client systems 108. The content information forwarded to client systems 108 may include both Web content information and television content information. In a specific embodiment of the present invention, as shown in Fig. 1, distribution centers 106 comprise cable headends (H/E)s.

Client systems 108 receive multimedia content, including Web content and television content, from distribution centers 106 and output the content to a user. One or more client systems may be coupled to a distribution center 106. Fig. 2 depicts a simplified block diagram of a client system 108 according to an embodiment of the present invention. As shown, client system 108 comprises a processing unit 130 coupled to an output device 132 via communication link 142, and a control device 138 coupled to processing unit 130 via a communication link 140.

Output device 132 is configured to output multimedia content information to the user of client system 108. Examples, of an output device include a television, a computer, or other like device. In a preferred embodiment of the present invention, output device 132 is a broadband Internet-enabled television system. Output device 132 may include an audio output device 134 for outputting audio information to the user and a display device 136 for outputting video, image, and text information to the user. Display device 136 may be a cathode ray tube (CRT), a flat-panel device such as a liquid crystal display (LCD), a projection device, or any other device suitable for outputting visual information, including streaming video, images, and text, to the user. Audio output device 134 may be a speaker, and other like devices suitable for outputting audio information embedded in the Web content and television content received from

distribution center 106. Although, Fig. 2 depicts an output device in which display device 136 and audio output device 134 are integrated into one unit, in alternate embodiments of the present invention the display device may be embodied in a separate unit from the audio output device.

5 Control device 138 may be used by the user to control the functionality of client system 108. Control device 138 communicates with processing unit 130 via communication link 140 which is generally an infrared (IR) communication link. However, in alternate embodiments of the present invention, communication link 140 may also be a hardwire link, an optical link, or any other means for communicating 10 information from control device 138 to processing unit 130. Control device 138 may be embodied as a television remote control device, a keyboard, a mouse, or any other device which allows a user to input information to client system 108. According to the teachings of the present invention, control device 138 provides a mechanism, for example, a button, which allows the user to change or specify the source of audio signals which are output to 15 the user via audio output device 134. The source of the audio signals, or the "audio source" is generally embedded in the multimedia content, including Web and television content, which is received by processing unit 130 from distribution center 106.

Fig. 4 depicts an exemplary control device 150 according to an embodiment of the present invention. Control device 150 may be used to control the 20 functionality of client system 108. As shown, control device 150 has the general appearance of a common, hand-held remote comprising a plurality of buttons to control the functions of client system 108. In particular, according to the teachings of the present invention, control device 150 comprises an "audio source" button 152 which allows the user to specify/change the source of audio signals which are output to the user. For 25 example, when the user selects button 152 (e.g. when the user clicks on button 152), a signal may be communicated to processing unit 130 via communication link 140 instructing the processing unit to select an audio source whose audio signals are to be output to the user via output device 132.

Referring back to Fig. 2, according to an embodiment of the present 30 invention, processing unit 130 is generally a set-top box (hereinafter processing unit 130 will be referred to as set-top box 130) which includes hardware and software to receive multimedia content information, including Web content and television content, from distribution centers 106 and to output the multimedia content to the user via output device 132. Set-top box 130 also performs functions allowing the user to control the manner in

which the multimedia content is downloaded to client system 108 and presented to the user. According to the teachings of the present invention, set-top box 130 includes components and modules which allow the user to change or specify audio sources whose audio signals are output to the user via output device 132. Set-top box 130 is coupled to output device 132 via communication link 142. Communication link 142 may include a video channel for communicating video information from set-top box 130 to output device 132 and an audio channel for communicating audio information from set-top box 130 to output device 132.

Fig. 3 is a simplified block diagram of an exemplary set-top box 130 according to an embodiment of the present invention. Set-top box 130 typically includes at least one processor 162 which communicates with a number of peripheral devices via a bus subsystem 160. These peripheral devices may include a storage subsystem 164, comprising a memory subsystem 166 and a file storage subsystem 172, a video subsystem 178, an audio subsystem 176, a distribution center interface subsystem 174, and a control device interface subsystem 180.

Distribution interface subsystem 174 provides an interface for receiving multimedia content information from distribution center 106. The multimedia content is then processed and forwarded to display device 136 and/or to audio output device 134 for output to the user. Control device interface subsystem 180 detects signals received from control device 138 and provides instructions/information encapsulated in the signals to processor 162 for further processing.

Audio subsystem 176 is responsible for processing audio content received from distribution center 106, and transmitting the processed audio signals to audio output device 134 for output to the user. Likewise, video subsystem 178 is responsible for processing video content received from distribution center 106, and transmitting the processed video signals to display device 136 for output to the user.

Storage subsystem 164 stores the basic programming modules and data constructs that provide the functionality of the various systems embodying the present invention. For example, databases and modules implementing the functionality of the audio source button may be stored in storage subsystem 164. These software modules are generally executed by processor 162. Storage subsystem 164 may comprise memory subsystem 166 and file storage subsystem 172.

Memory subsystem 166 typically includes a number of memories including a main random access memory (RAM) 170 for storage of instructions and data

5 during program execution and a read only memory (ROM) 168 in which fixed instructions are stored. File storage subsystem 172 provides persistent (non-volatile) storage for program and data files, and may include a hard disk drive, a floppy disk drive along with associated removable media, a Compact Digital Read Only Memory (CD-ROM) drive, an optical drive, or removable media cartridges. The databases and modules implementing the functionality of the present invention may also be stored by file storage subsystem 172.

10 Bus subsystem 160 provides a mechanism for letting the various components and subsystems of set-top box 130 communicate with each other as intended. Although bus subsystem 160 is shown schematically as a single bus, alternate embodiments of the bus subsystem may utilize multiple buses. Further, in alternate embodiments of the present invention, the various components of set-top box 130 may be directly coupled to processor 162.

15 Due to the ever-changing nature of processing units 130, the description of set-top box 130 depicted in Fig. 3 is intended only as a specific example for purposes of illustrating the preferred embodiment of the present invention. Many other configurations of processing unit 130 are possible having more or less components than the processing unit 130 depicted in Fig. 3.

20 Fig. 5 depicts a simplified flowchart 190 depicting processing performed according to an embodiment of the present invention. According to the present invention, a control, for example, button 152 depicted in Fig. 4, is provided on control device 138 for changing the source of audio signals played by audio output device 134. For example, by clicking on audio source button 152 situated on control device 138 depicted in Fig. 4, the user can change the source of the audio signals communicated to audio output device 134. As previously stated, several audio sources may be embedded in the Web content and television content received by set-top box 130 from distribution center 106. For example, audio sources embedded in the Web content may include Uniform Resource Locators (URLs) linking to audio clips. Audio clips may also be associated with web pages received from distribution center 106. Further, applications such as "chat" may 25 also provide sources of audio information. Further, television content may have its own audio source. In general, an audio source may be any object, element, or content embedded in the Web content or television content received from distribution center 106 which has audio information associated with it.

Processing depicted in Fig. 5 is initiated when set-top box 130 receives a signal from control device 138 indicating that the user has selected (or clicked) the control, for example, audio source button 152, on control device 138 which controls the source of audio signals played by audio output device 134 (step 192). For purposes of this application, the control will be referred to as the audio source button. As discussed above, signals from control device 138 are received by control device interface 180 via communication link 140. The instructions/information contained in the signal is then made available to processor 162 for further processing. Software modules executed by processor 162 then determine an audio source, from the Web content and television content, whose signals are to be communicated to audio output device 134 for output to the user (step 194). The audio signals from the audio source determined in step 194 are then transmitted to audio output device 134 for output to the user (step 196).

Several different techniques may be used by the present invention to determine the audio source in step 194. According to one technique, the present invention may cycle through the available audio sources when the user clicks on audio source button 152. Fig. 6 depicts a simplified flowchart 200 showing processing performed by set-top box 130 for cycling through a list of available audio sources according to an embodiment of the present invention. As shown in Fig. 6, upon receiving a signal (hereinafter referred to as the "audio source button signal") from control device 138 indicating that the user has selected audio source button 152, set-top box 130 determines all the audio sources embedded in the Web content and/or the television content received from distribution center 106 (step 202). The audio sources may be organized in an ordered list, to allow set-top box 130 to more easily select the next audio source to be output to the user.

Set-top box 130 then determines the audio source whose signals are presently being played by audio output device 134, or alternatively, if no audio signal is currently being played, set-top box 130 determines the audio source which was last played (step 204). Set-top box 130 then determines the "next" audio source, from the ordered list of audio sources determined in step 201, whose audio signals are to be communicated to audio output device 134 to be output to the user (step 206). Audio signals associated with the "next" audio source are then transmitted to audio output device 134 for output to the user (step 208). According to the embodiment of the present invention depicted in Fig. 6, every time a user clicks or selects audio source button 152, audio signals associated with a "next" audio source are communicated to audio output

device 134 to be output to the user. In this manner, the present invention allows the user to cycle through all the available audio sources by repeatedly clicking on audio source button 152.

According to a more elaborate technique, the present invention may allow 5 the user to specifically select an audio source whose audio signals are to be output to the user via audio output device 134. Fig. 7 depicts a simplified flowchart 220 showing processing performed by set-top box 130 according to this embodiment of the present invention. As shown in Fig. 7, upon receiving the audio source button signal, set-top box 130 determines all the audio sources embedded in the Web content and/or the television 10 content received from distribution center 106 (step 220). Set-top box 130 then generates a user interface which displays the available audio sources to the user (step 222). The user interface is generally presented to the user via display device 136. Various types of user interfaces may be provided allowing the user to select a particular audio source. The user may then use the various buttons located on remote control device 138 to select a 15 particular audio source whose signals are to be output via audio output device 134 (step 224). Upon receiving the user's selection, set-top box 130 then transmits audio signals associated with the user-selected audio source to audio output device 134 for output to the user (step 226). In this manner, according to the embodiment of the present invention depicted in Fig. 7, the user may specifically indicate an audio source whose signals are to 20 be output.

As described above, the present invention allows the user to control the audio signals which are output to the user via audio output device 134. It should be apparent that various other techniques, in addition to those described in Figs. 6 and 7, may be used by the present invention to determine an audio source to be played back to 25 the user.

Although specific embodiments of the invention have been described, various modifications, alterations, alternative constructions, and equivalents are also encompassed within the scope of the invention. The described invention is not restricted to operation within certain specific data processing environments, but is free to operate 30 within a plurality of data processing environments. Additionally, although the present invention has been described using a particular series of transactions and steps, it should be apparent to those skilled in the art that the scope of the present invention is not limited to the described series of transactions and steps.

Further, while the present invention has been described using a particular combination of hardware and software, it should be recognized that other combinations of hardware and software are also within the scope of the present invention. The present invention may be implemented only in hardware or only in software or using  
5 combinations thereof.

The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. It will, however, be evident that additions, subtractions, deletions, and other modifications and changes may be made thereunto without departing from the broader spirit and scope of the invention as set forth in the  
10 claims.

WHAT IS CLAIMED IS:

1               1. In a system for viewing Web content information and television  
2 content information, a method of outputting audio information associated with the Web  
3 content information and the television content information, the method comprising:  
4               receiving Web content information and television content information, the  
5 Web and television content information including a plurality of audio sources;  
6               receiving a first signal from a control device;  
7               in response to the first signal, determining a first audio source from the  
8 plurality of audio sources;  
9               transmitting audio signals associated with the first audio source to an audio  
10 output device; and  
11               outputting the audio signals associated with the first audio source via the  
12 audio output device.

1               2. The method of claim 1 wherein receiving the first signal from the  
2 control device comprises:  
3               selecting a button on the control device;  
4               generating the first signal in response to selecting the button; and  
5               receiving the first signal from the control device via a first communication  
6 link.

1               3. The method of claim 2 wherein the first communication link is a  
2 wireless link.

1               4. The method of claim 1 wherein determining the first audio source  
2 from the plurality of audio sources comprises:  
3               determining the plurality of audio sources included in the Web content  
4 information and television content information;  
5               generating an ordered list of the plurality of audio sources;  
6               determining a current audio source, wherein audio signals associated with  
7 the current audio source are being output via the audio output device; and  
8               determining the first audio source from the ordered list of the plurality of  
9 audio sources, the first audio source following the current audio source in the ordered list  
10 of the plurality of audio sources.

1               5.     The method of claim 1 wherein determining the first audio source  
2 from the plurality of audio sources comprises:

3               determining the plurality of audio sources included in the Web content  
4 information and television content information;

5               generating an ordered list of the plurality of audio sources;

6               determining a previous audio source, wherein audio signals associated  
7 with the previous audio source were last output via the audio output device; and

8               determining the first audio source from the ordered list of the plurality of  
9 audio sources, the first audio source following the previous audio source in the ordered  
10 list of the plurality of audio sources.

1               6.     The method of claim 1 wherein determining the first audio source  
2 from the plurality of audio sources comprises:

3               determining the plurality of audio sources included in the Web content  
4 information and television content information;

5               generating a user interface displaying the plurality of audio sources;

6               displaying the user interface; and

7               receiving a signal indicating selection of the first audio source from the  
8 user interface displaying the plurality of audio sources.

1               7.     The method of claim 1 further comprising:

2               receiving a second signal from the control device;

3               in response to the second signal, determining a second audio source from  
4 the plurality of audio sources;

5               transmitting audio signals associated with the second audio source to the  
6 audio output device; and

7               outputting the audio signals associated with the second audio source via  
8 the audio output device.

1               8.     The method of claim 7 wherein the first audio source is embedded  
2 in the Web content information and the second audio source is embedded in the television  
3 content information.

1                 9.     The method of claim 7 wherein the first audio source is embedded  
2     in the television content information and the second audio source is embedded in the Web  
3     content information.

1                 10.    In a system for viewing Web content information and television  
2     content information comprising a set-top box coupled to an audio output device via a first  
3     communication link and coupled to a control device via a second communication link, a  
4     set-top box implemented method for outputting audio signals comprising:

5                     receiving Web content information and television content information, the  
6     Web and television content information including a plurality of audio sources;

7                     receiving a first signal from the control device;

8                     determining a first audio source from the plurality of audio sources in  
9     response to the first signal; and

10                  transmitting audio signals associated with the first audio source to the  
11     audio output device.

1                 11.    A system for viewing Web content information and television  
2     content information, the system comprising:

3                     a set-top box configured to receive Web content information and television  
4     content information via a first communication link, the Web and television content  
5     information including a plurality of audio sources;

6                     an audio output device coupled to the set-top box; and

7                     a control device configured to transmit signals to the set-top box via a  
8     second communication link;

9                     wherein the set-top box is configured to:

10                  receive a first signal from the control device;

11                  to determine a first audio source from the plurality of audio sources  
12     in response to the first signal;

13                  and to transmit audio signals associated with the first audio source  
14     to the audio output device; and

15                  wherein the audio output device is configured to output the audio signals  
16     associated with the first audio source.

- 1                   12.     The system of claim 11:  
2                       wherein the control device provides a button, wherein selection of the  
3     button generates the first signal; and  
4                       wherein the set-top box is configured to receive the first signal from the  
5     control device via the second communication link.
- 1                   13.     The system of claim 11 wherein the first communication link is a  
2     cable link.
- 1                   14.     The method of claim 11 wherein the second communication link is  
2     a wireless link.
- 1                   15.     The system of claim 11 wherein to determine the first audio source  
2     from the plurality of audio sources, the set-top box is configured to:  
3                       determine the plurality of audio sources included in the Web content  
4     information and television content information;  
5                       generate an ordered list of the plurality of audio sources;  
6                       determine a current audio source, wherein audio signals associated with  
7     the current audio source are being output via the audio output device; and  
8                       determine the first audio source from the ordered list of the plurality of  
9     audio sources, the first audio source following the current audio source in the ordered list  
10    of the plurality of audio sources.
- 1                   16.     The system of claim 11 wherein to determine the first audio source  
2     from the plurality of audio sources, the set-top box is configured to:  
3                       determine the plurality of audio sources included in the Web content  
4     information and television content information;  
5                       generate an ordered list of the plurality of audio sources;  
6                       determine a previous audio source, wherein audio signals associated with  
7     the previous audio source were last output via the audio output device; and  
8                       determine the first audio source from the ordered list of the plurality of  
9     audio sources, the first audio source following the previous audio source in the ordered  
10    list of the plurality of audio sources.

1               17. The system of claim 11 further comprising a display device  
2 coupled to the set-top box:  
3                          wherein to determine the first audio source from the plurality of audio  
4 sources, the set-top box is configured to:  
5                          determine the plurality of audio sources included in the Web  
6 content information and television content information; and  
7                          generate a user interface displaying the plurality of audio sources;  
8                          wherein the display device is configured to display the user interface; and  
9                          wherein the first audio source is configured to receive a signal indicating  
10 selection of the first audio source from the user interface displaying the plurality of audio  
11 sources.

1               18. The system of claim 11:  
2                          wherein the set-top box is further configured to:  
3                          receive a second signal from the control device;  
4                          determine a second audio source from the plurality of audio  
5 sources in response to the second signal; and  
6                          transmit audio signals associated with the second audio source to  
7 the audio output device; and  
8                          wherein the audio output device is further configured to output the audio  
9 signals associated with the second audio source.

1               19. The system of claim 18 wherein the first audio source is embedded  
2 in the Web content information and the second audio source is embedded in the television  
3 content information.

1               20. The system of claim 18 wherein the first audio source is embedded  
2 in the television content information and the second audio source is embedded in the Web  
3 content information.

1               21. In a system for viewing Web content information and television  
2 content information comprising a set-top box coupled to an audio output device via a first  
3 communication link and to a control device via a second communication link, the set-top  
4 box configured to:

5 receive Web content information and television content information, the  
6 Web and television content information including a plurality of audio sources;  
7 receive a first signal from the control device via the second  
8 communication link;  
9 determine a first audio source from the plurality of audio sources in  
10 response to the first signal; and  
11 transmit audio signals associated with the first audio source to the audio  
12 output device via the first communication link.

1 22. The set-top box of claim 21 wherein to determine the first audio  
2 source from the plurality of audio sources in response to the first signal, the set-top box is  
3 configured to:

4 determine the plurality of audio sources included in the Web content  
5 information and television content information;  
6 generate an ordered list of the plurality of audio sources;  
7 determine a current audio source, wherein audio signals associated with  
8 the current audio source are being output via the audio output device; and  
9 determine the first audio source from the ordered list of the plurality of  
10 audio sources, the first audio source following the current audio source in the ordered list  
11 of the plurality of audio sources.

1 23. The set-top box of claim 21 wherein to determine the first audio  
2 source from the plurality of audio sources in response to the first signal, the set-top box is  
3 configured to:

4 determine the plurality of audio sources included in the Web content  
5 information and television content information;  
6 generate an ordered list of the plurality of audio sources;  
7 determine a previous audio source, wherein audio signals associated with  
8 the previous audio source were last output via the audio output device; and  
9 determine the first audio source from the ordered list of the plurality of  
10 audio sources, the first audio source following the previous audio source in the ordered  
11 list of the plurality of audio sources.

1               24. The set-top box of claim 21 wherein to determine the first audio  
2 source from the plurality of audio sources in response to the first signal, the set-top box is  
3 configured to:

4               determine the plurality of audio sources included in the Web content  
5 information and television content information; and

6               generate a user interface displaying the plurality of audio sources; and  
7 receive a signal indicating selection of the first audio source from the user  
8 interface displaying the plurality of audio sources.

1               25. The set-top box of claim 21 further configured to:

2               receive a second signal from the control device via the second  
3 communication link;

4               determine a second audio source from the plurality of audio sources in  
5 response to the second signal; and

6               transmit audio signals associated with the second audio source to the audio  
7 output device via the first communication link.

1               26. The set-top box of claim 25 wherein the first audio source is  
2 embedded in the Web content information and the second audio source is embedded in  
3 the television content information.

1               27. The set-top box of claim 25 wherein the first audio source is  
2 embedded in the television content information and the second audio source is embedded  
3 in the Web content information.

1               28. A computer program product embodied in a computer-readable  
2 storage medium, the code comprising:

3               code for receiving Web content information and television content  
4 information, the Web and television content information including a plurality of audio  
5 sources;

6               code for receiving a first signal from a control device;

7               code for determining a first audio source from the plurality of audio  
8 sources in response to the first signal; and

9               code for transmitting audio signals associated with the first audio source to  
10 an audio output device.

1           29. The computer-program product of claim 28 wherein the code for  
2 determining the first audio source from the plurality of audio sources comprises:

3                 code for determining the plurality of audio sources included in the Web  
4 content information and television content information;  
5                 code for generating an ordered list of the plurality of audio sources;  
6                 code for determining a current audio source, wherein audio signals  
7 associated with the current audio source are being output via the audio output device; and  
8                 code for determining the first audio source from the ordered list of the  
9 plurality of audio sources, the first audio source following the current audio source in the  
10 ordered list of the plurality of audio sources.

1           30. The computer-program product of claim 28 wherein the code for  
2 determining the first audio source from the plurality of audio sources comprises:

3                 code for determining the plurality of audio sources included in the Web  
4 content information and television content information;  
5                 code for generating an ordered list of the plurality of audio sources;  
6                 code for determining a previous audio source, wherein audio signals  
7 associated with the previous audio source were last output via the audio output device;  
8 and

9                 code for determining the first audio source from the ordered list of the  
10 plurality of audio sources, the first audio source following the previous audio source in  
11 the ordered list of the plurality of audio sources.

1           31. The computer-program product of claim 28 wherein the code for  
2 determining the first audio source from the plurality of audio sources comprises:

3                 code for determining the plurality of audio sources included in the Web  
4 content information and television content information;

5                 code for generating a user interface displaying the plurality of audio  
6 sources; and

7                 code for receiving a signal indicating selection of the first audio source  
8 from the user interface displaying the plurality of audio sources.

1           32. The computer-program product of claim 28 further comprising:  
2                 code for receiving a second signal from the control device;

3                   code for determining a second audio source from the plurality of audio  
4   sources in response to the second signal; and  
5                   code for transmitting audio signals associated with the second audio source  
6   to the audio output device.

1                 33.   The computer-program product of claim 32 wherein the first audio  
2   source is embedded in the Web content information and the second audio source is  
3   embedded in the television content information.

1                 34.   The computer-program product of claim 32 wherein the first audio  
2   source is embedded in the television content information and the second audio source is  
3   embedded in the Web content information.

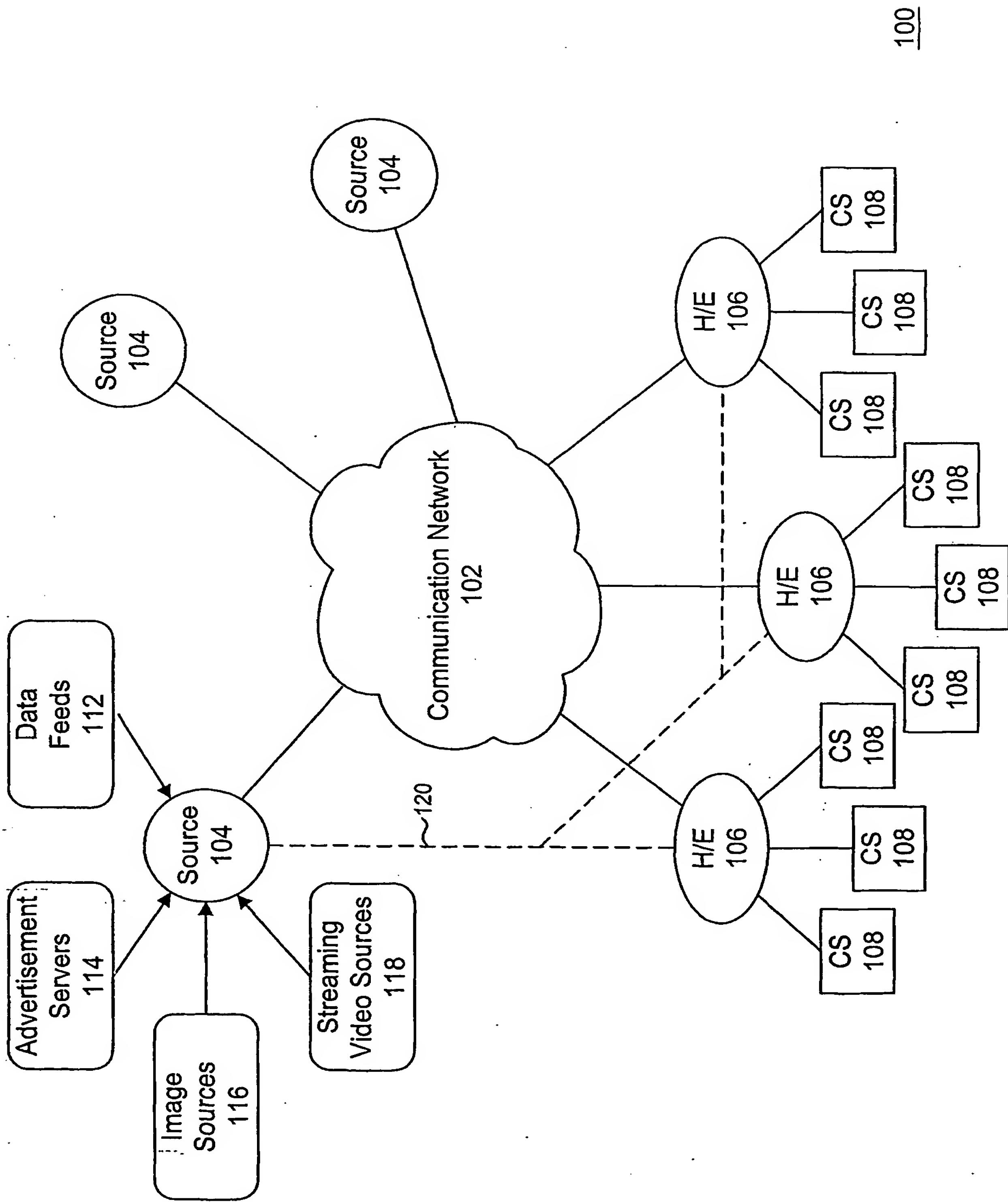
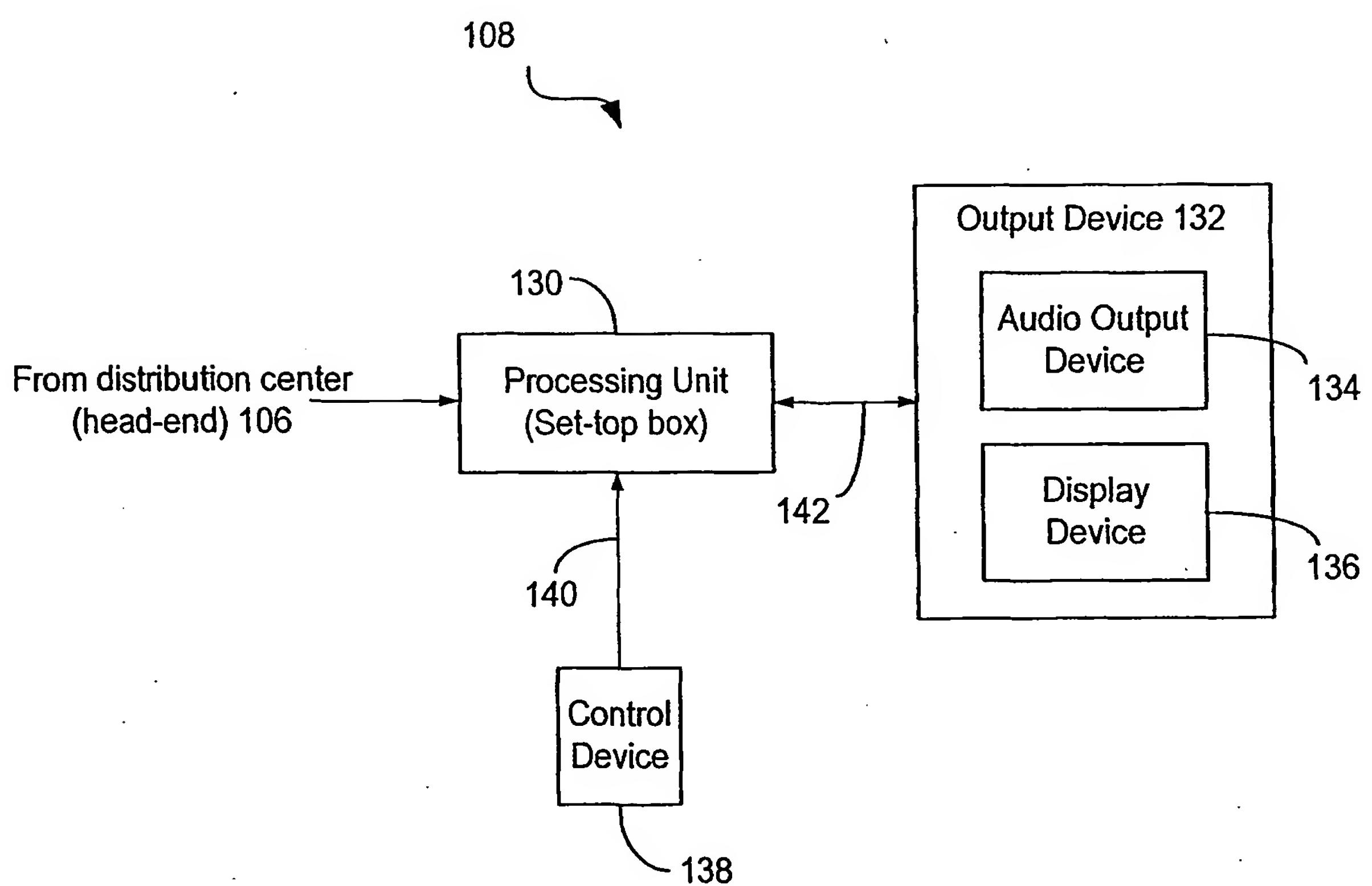
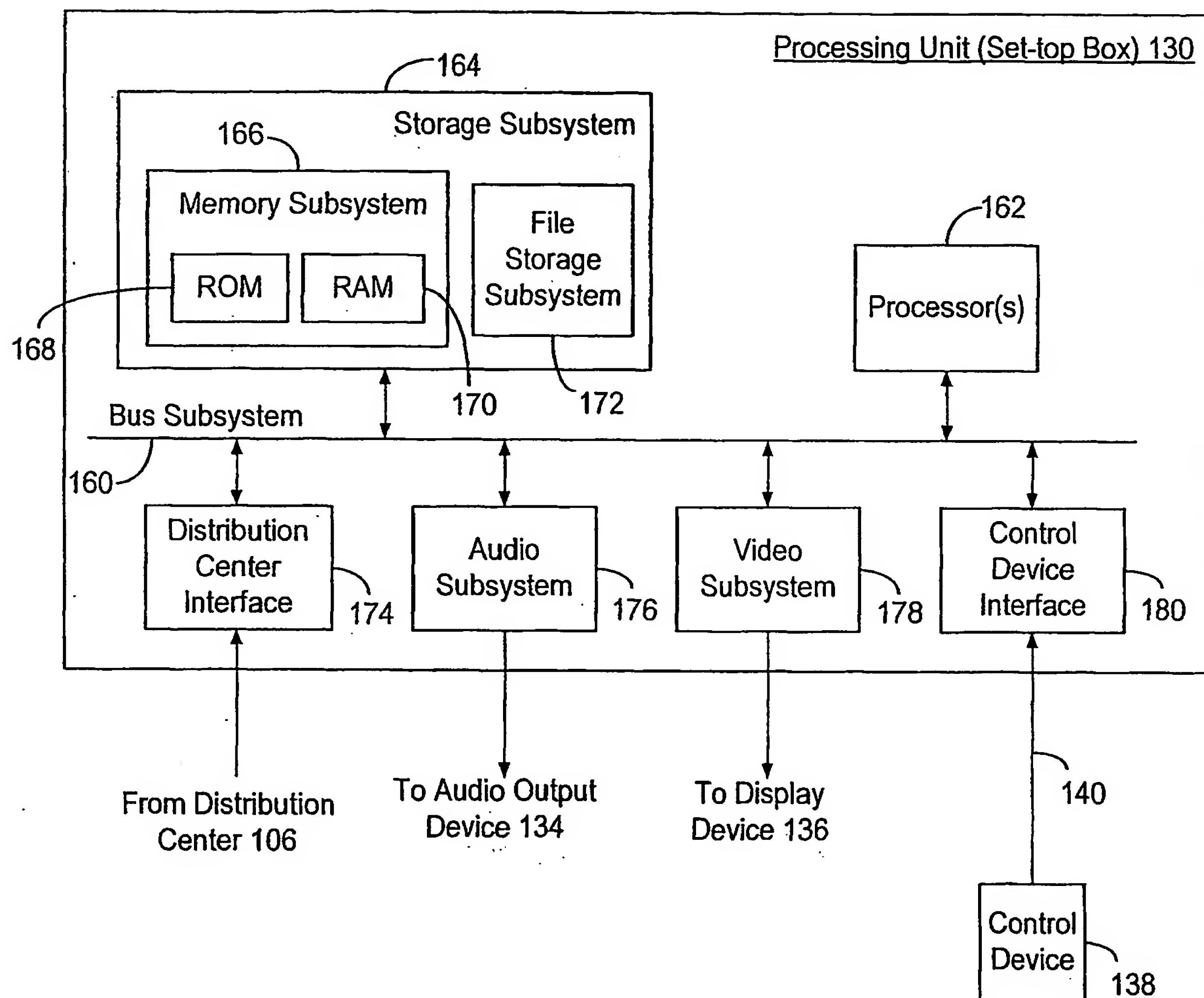


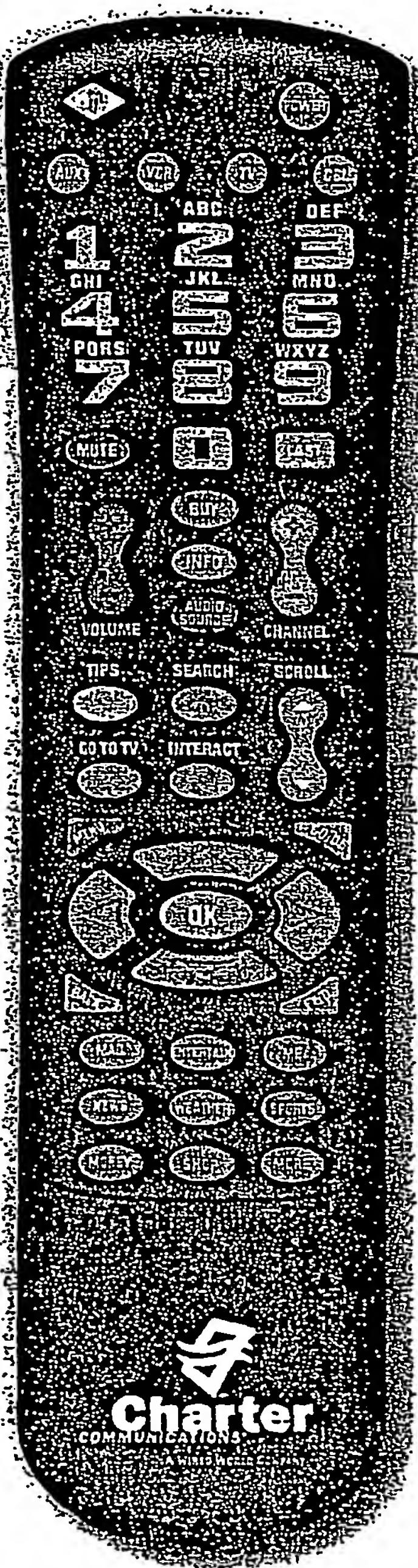
FIG. 1



**Fig. 2**



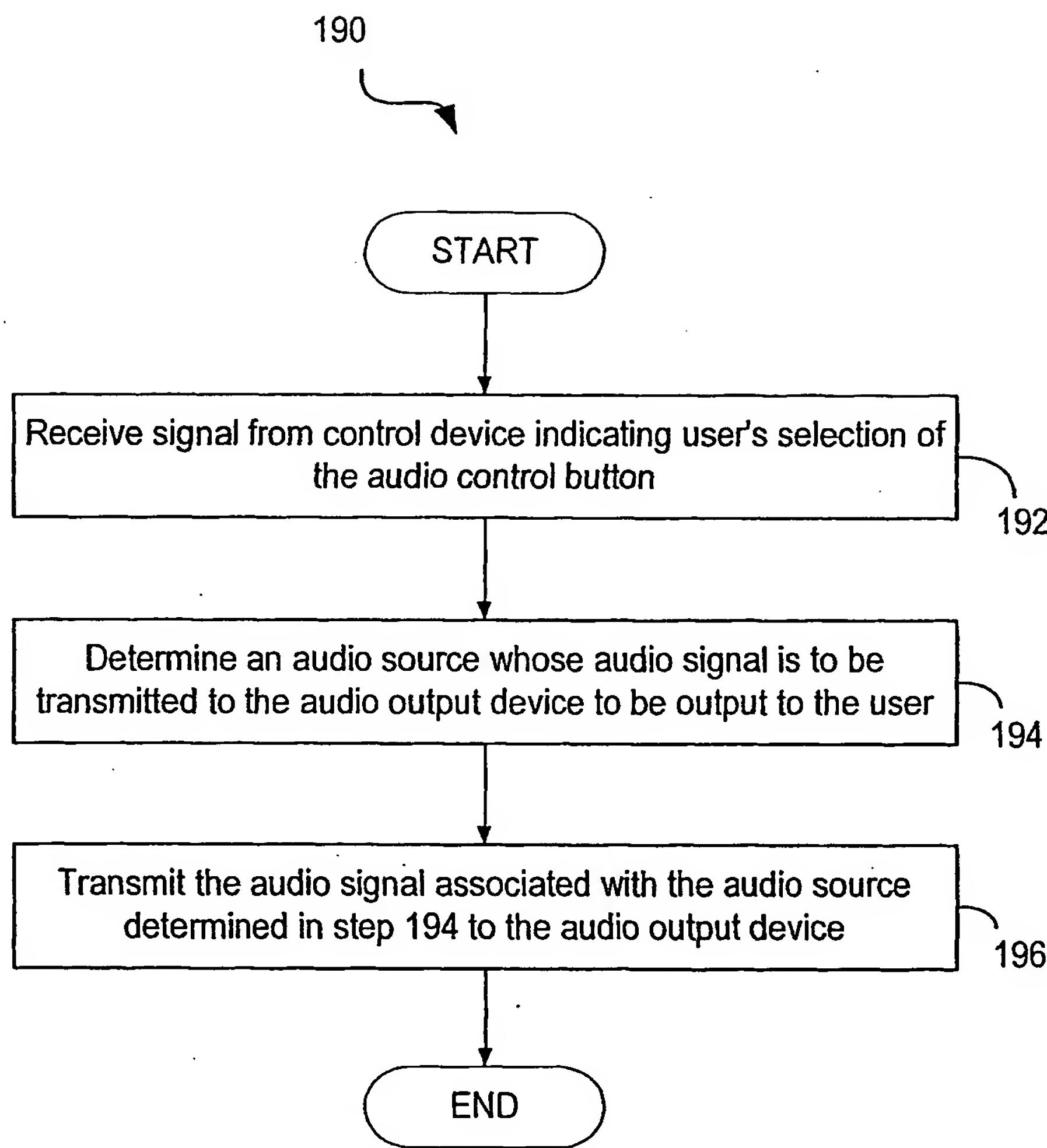
**Fig. 3**



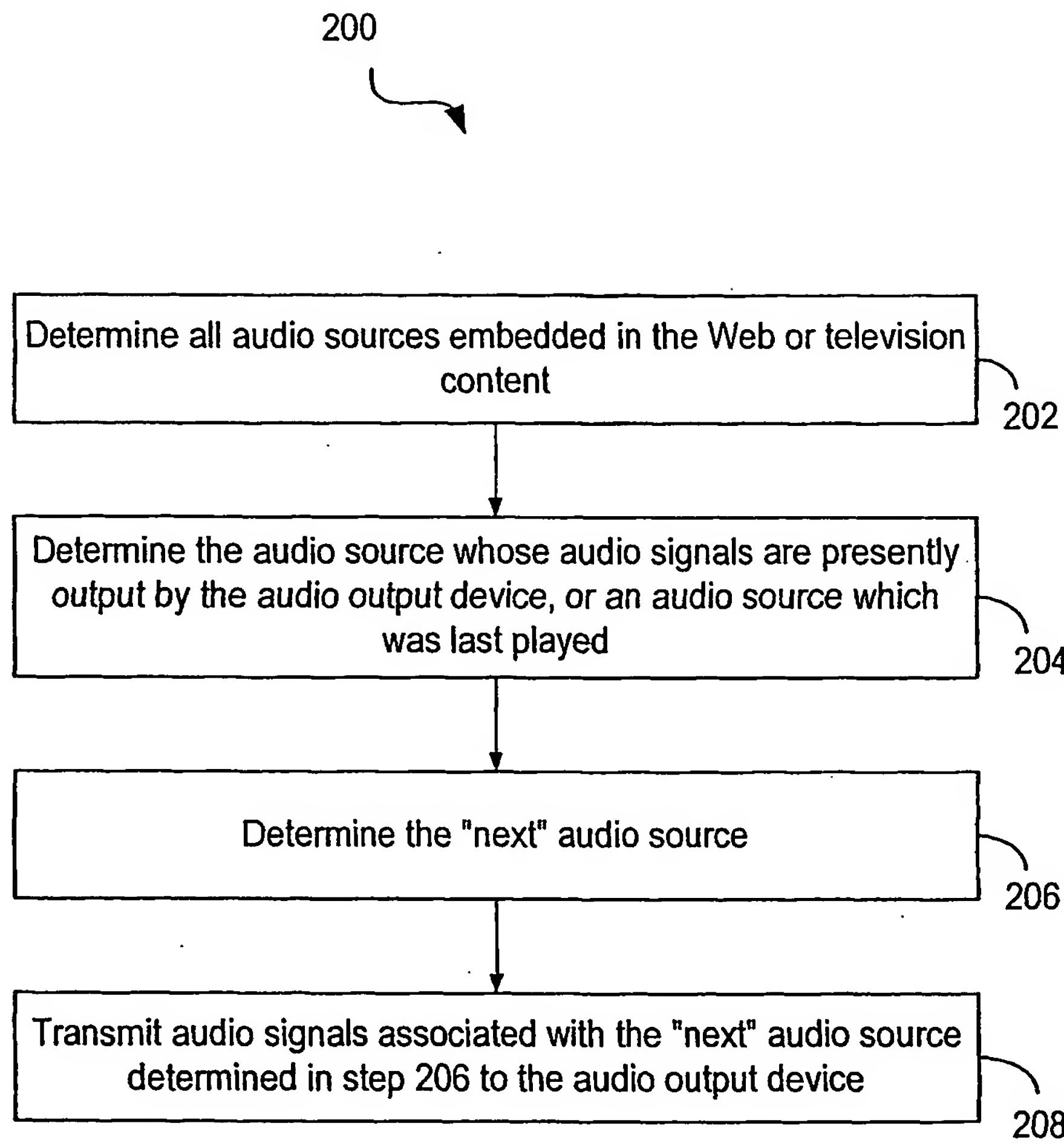
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152

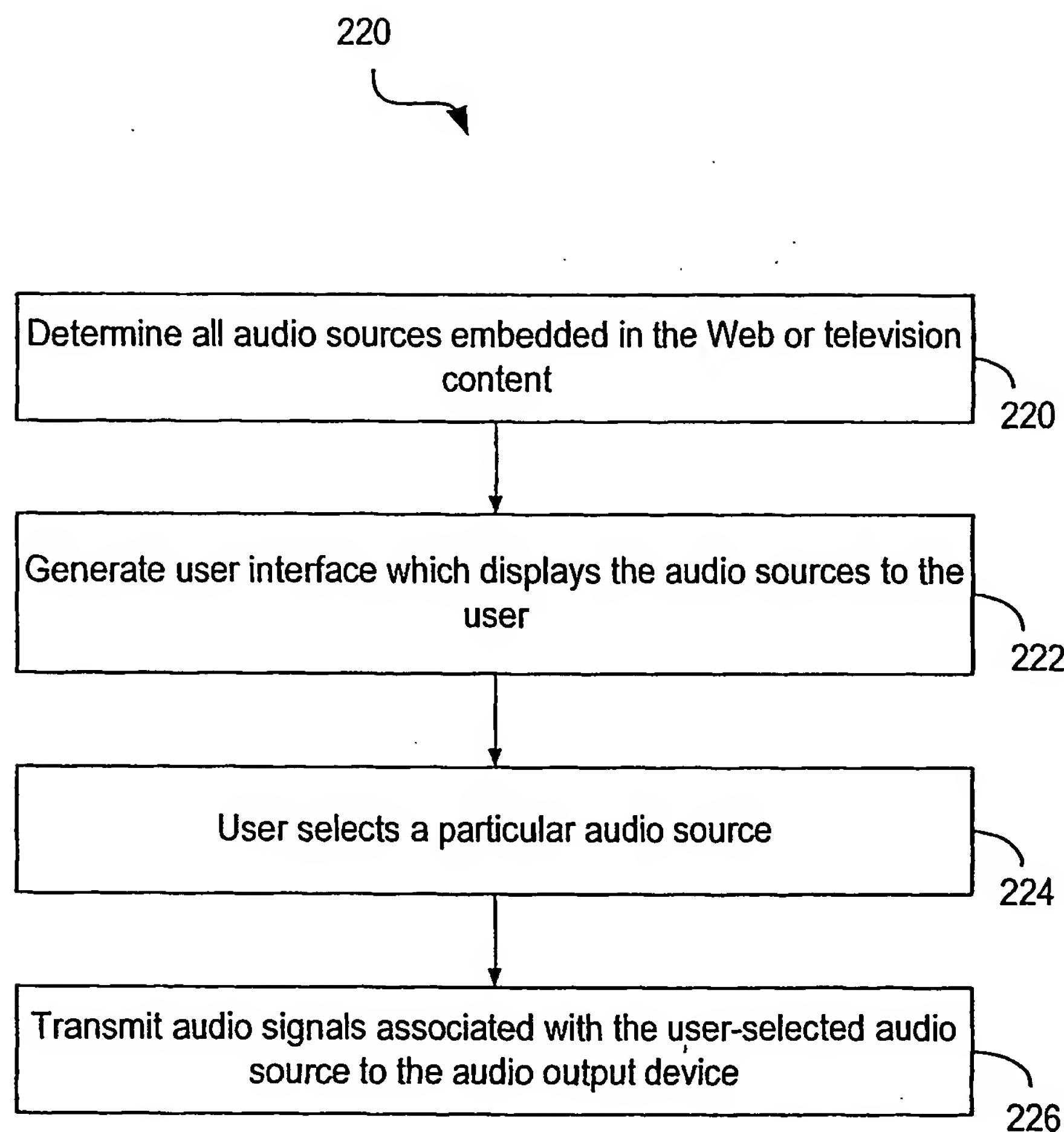
Fig. 4



***Fig. 5***



***Fig. 6***



**Fig. 7**

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/09556

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04N 7/173  
US CL : 725/109

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 725/109

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EAST

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,005,563 A (WHITE et al.) 21 December 1999 (21.12.1999), col. 3, lines 33-37; col. 4, lines 14-41.	1-3, 6-14, 17-21, 24-28, 31-34
Y		4, 5, 15, 16, 22, 23, 29, 30
Y	US 5,703,794 A (HEDDLE et al.) 30 December 1997 (30.12.1997), col. 2, lines 10-16; col. 9, lines 48-61; col. 15, lines 53-56.	4, 5, 15, 16, 22, 23, 29, 30
A	US 5,977,963 A (GAUGHAN et al.) 02 November 1999 (02.11.1999), abstract.	1-34
A	US 5,929,922 A (STEVENS et al.) 27 July 1999 (27.07.1999), abstract.	1-34

Further documents are listed in the continuation of Box C.

See patent family annex.

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"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

11 June 2001 (11.06.2001)

Date of mailing of the international search report

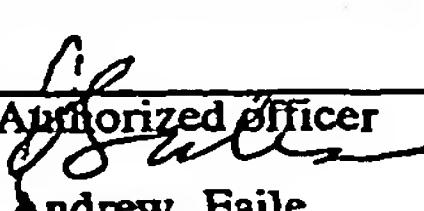
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